the clear is 91 feet, the breadth 45 feet, and the height 45 feet,—so that it is a double cube. From the north wall to the bar is 21 feet. The height from the floor to the spring of soffit of side galleries (or cores) is 11 feet; from the floor to the cill of the windows it is 21 feet. The side galleries are 3 feet wide, having only one row of seats. The thickness of the walls of the House is 3 feet 1 inch, with recesses at intervals.

The materials already used include from eight to nine hundred thousand tons of stone, twenty-four millions of bricks, and five thousand tons of iron.*

SHOULD PROPER VENTILATION BE ENFORCED?

ROYAL INSTITUTE OF ARCHITECTS.

At a meeting of the Institute on Monday evening last, Mr. C. Fowler in the chair, Col. Leake was elected an honorary member, and Mr. J. D. Hopkins was elected a fellow.

Mr. Toynbee, F.R.S., read a paper on ventilation, and how far it may be rendered compulsory by legislative enactments.

The author of the paper commenced by stating, that the result of the extended investigations so long conducted by the medical profession into the nature and treatment of disease, demonstrated that the great duty of every man was to carry out preventive measures. English people seemed to be but little aware of the large amount of disease by which man at the present time is afflicted; and yet the details in Lord Morpeth's recent speech, the returns of the registrar-general, and statistics from various sources, shewed that among them disease was the rule, and health was the exception. Let it be continually repeated, and never forgotten, that one-fourth of the children born in England die before they reach the fifth year, and out of 49,089 people who died in London in the year 1846, 22,275 died before they reached their *fifteenth* year, and only 2,241 of *old age*, which Boerhaave stated to be the only disease natural to man. In addition to this, it must be known, that as a general rule, when the body is examined after death, whether of a child or adult, one or more organs is found to a state of disease, a fact which induced a physician to state, that he looked upon every adult he met in the streets of London as a walking museum of morbid anatomy. If the causes of the 49,089 deaths in 1846 be examined, it will be found that the enormous proportion of 14,368 were from diseases of the organs of respiration. Now, it has been shewn that the great source of these diseases was the respiration of impure air. To suggest measures for the removal of this great evil, and to prevent some of the most distressing diseases to which mankind is subject, was his object in responding to the request of the society, that he would deliver the present address. Mr. Toynbee then proceeded to consider the subject of ventilation in its various bearings. In proof of the *necessity for ventilation*, he stated that it was of great importance that air should be continually in motion, for, like water, when stagnant it became offensive and injurious. This was accounted for by the fact that the air always contained a large quantity of animal and vegetable matter in the form of the ova of infusoria, and the seeds of the lower vegetable organisms. But the act of respiration was the great cause of the deterioration of the air. The air in the lungs was exposed in 170,000,000 of cells, having a surface equal to thirty times that of the body; that during respiration the air was deprived of oxygen, and became loaded with deadly carbonic acid gas, and was rendered totally unfit for a second respiration, being in reality no longer atmospheric air, but a poisonous gas.

A second cause of the deterioration of the air is the combustion of lamps, gas-lights, candles, &c. A single candle is nearly as injurious to the air as a human being. Two fourteen-hole argand burners consumed as much air as eleven men. *A third source* of atmospheric impurity is the vapour loaded with animal matter, given off from the lungs and the skin; each of these parts pours out an ounce of fluid every hour, so that in a church containing 500 people, twelve gallons of noxious fluid are given off in two hours. *A fourth source* of bad air in towns is the large quantity of decomposing animal and vegetable matter, left to give off its effluvia, and the difficulty there is in the renewal of the air in towns by means of the winds, on account of the vicious mode of their construction and their large size. In reference to the impurity of the air of London, Dr. Mantell states, that various classes of infusoria, which he was in the habit of keeping alive in his house at Clapham, all died in London; and it is well known, that scarcely any plants will live in London.

It was then stated, that certain diseases were distinctly traceable to the *absence of ventilation;* viz., fever, consumption, scrofula, deafness, and that most fertile origin of numerous diseases, the common "cold." It was shewn, that 120,000 people in England and Wales are always slowly dying from consumption; that there is double the amount of this disease among in-door than there is among out-door labourers; that this disease was more frequent among women than among men; that in 1839, out of thirty-three milliners who died in London, twenty-eight died of consumption. Mr. Toynbee then shewed, that up to the present time the subject of ventilation had been entirely neglected in the construction of rooms, houses, towns, and cities; that the greatest injury had been inflicted upon mankind by this neglect; and as the population increased and towns became larger, the evil must become greater, unless remedies were at once carried into effect. Under these circumstances, until society should be sufficiently informed voluntarily to secure its well being, it was the bounden duty of Government, the enlightened guide of its people, to suggest measures and see them carried out, to prevent the large amount of misery that the absence of ventilation was producing. The important question then was, how far could Government interfere with advantage in enforcing plans of ventilation by legislative enactments? Mr. Toynbee then submitted the following propositions for the adoption of Government, to the consideration of the Institute:—

1. That no living, sleeping, or work room shall contain less than 144 superficial feet, or shall be less than 8 feet high.

2. That such room shall have one window at least, opening at the top.

3. Also an open fire-place.

4. That in every living, sleeping, or work-room, erected in future, some method shall be adopted of allowing the foul air to escape from the upper part of the room. He then pointed out the practicability of carrying out this provision, either by the introduction of Arnott's valve into the chimney—thousands of which were at this time in operation, and which might also be adapted to existing chimneys without fear of smoke, by the addition of a simple contrivance, which he described,—or a distinct channel might be made for the purpose. As a proof that ventilation must largely conduce to the prevention of disease, he stated, that during the past year there was a diminution of nearly 800 in the number of sick applying for admission to the St. George's and St. James's Dispensary; and it was believed that this, in part at least, was due to the improvement made by the Samaritan fund attached to the dispensary in ventilating the abodes of the poor in the district.

5. That every such room, erected in future, shall have some means of continually admitting fresh air.

6. In every public building in which gas is used, to insist upon the use of plans to carry off the products of combustion, and not to allow them to escape in a room. Various plans having this object, are in operation in hundreds of shops, and may be seen in many shops in Regent-street. By their use, not only are the goods in the shop saved from injury, but the health of the people is improved. He was happy to hear that in Covent Garden Theatre not a particle of the products of combustion from the gas was allowed to enter the theatre.

7. That all churches, schools, theatres, workshops, workhouses, and other public buildings, shall adopt such methods of ventilation as are approved by the Medical Officer of Health.

Mr. Toynbee pointed out how these desirable objects were to be carried out, and shewed that every house and room must be so arranged that it can be supplied with fresh air to replace the vitiated air which has been removed. Professor Hosking had carried out these plans in every part of his house; and until they were general, the diseases dependent upon the want of ventilation must be a scourge to society. He observed, that in all the stables now erecting, admirable plans of ventilation were adopted. Having given this subject deliberate consideration, he had arrived at the above conclusions, in which, among many others, he was supported by Dr. Sutherland, of Liverpool, and Dr. Guy, of London, two of his many fellow-labourers in the public health cause, whose enlightened intelligence was only equalled by their benevolence.

In conclusion, he stated that the various Health of Towns' Associations were at work heart and soul, instructing the masses of the people as to the best means of promoting their physical welfare, a labour in which every enlightened man should join; and he felt that if Government would lend all the aid in its power towards carrying out sanatory measures, not only would an enormous amount of misery be saved, but an extent of happiness would be gained of which we had at present only a faint idea.

The chairman having alluded generally to the importance of the subject, and invited discussion,—

Mr. Godwin said he was anxious to know if any gentleman present had examined Mr. Leslie's patent ventilating stove, wherein was a series of valves from the chimney-piece to the ceiling. He had given it some consideration himself, and it seemed to him greatly deserving attention. The fire burnt but few coals, and ventilation seemed insured by it. As a smaller flue was used for it than the Buildings Act allowed, the patentee was precluded from introducing the stoves, excepting in the country; he had little doubt, however, they would force their way into town in spite of the Act. It seemed somewhat curious that an Act purporting to be for the health and safety of the inhabitants of the metropolis, should serve as a bar to improvements in ventilation.

Mr. Toynbee said, he was perfectly well acquainted with Mr. Leslie's patent, approved it highly, and thought it much to be deplored that its use should be prevented by so unwise a clause in the Act. Smaller flues than were generally used were much to be desired.

Mr. Pocock thought small flues would soon choke and would not be found advantageous.

The chairman remarked, that he had found 6-inch flues for the thermometer-stove a considerable improvement over larger flues; and Mr. Mocatta said, in Lancashire and its neighbourhood, 9-inch pipes were greatly used, and answered perfectly well.

Dr. Guy said, he had seen Mr. Leslie's stove in operation on a very unfavourable day, and that it appeared to act most perfectly. It burnt very little coal, produced little ash, and afforded great facilities for the escape of vitiated air; he wished it might come into general use.

He then addressed the meeting at some length on the evils of impure air, to which he said, 5,000 persons were sacrificed every year in England. Attending at an hospital, he had found that a large number of letter-press printers came there with chest affections, and he was led in consequence to visit and examine several large establishments. The result of the facts he collected shewed, that in proportion to the quantity of pure air the men had to breathe so was the freedom from illness in the establishment. He thought Government should lay down the rule, that every workman should have 500 cubic feet to breathe in.*

INCONVENIENCE FROM DEFECTIVE PUGGING.—Much annoyance was found in the red drawing-room at Windsor Castle, when private balls were given, from dust. On taking up the floor, we are told, it was seen to proceed from the pugging being defective.

* On Wednesday, her Majesty and Prince Albert, inspected the New House of Lords preparatory to its being opened on Thursday, Her Majesty was received at the old royal entrance by Lord John Russell, the Lord Great Chamberlain, Mr. Barry, and Mr. Grissell, and spent nearly an hour and a-half in the inspection. The House will be opened to the public shortly.

* A small work, recently published by Sherwood and Co., "On the Remediable Evils attending the Life of the People," by Dr. Rumsey, appears to contain much useful information on the subject of ventilation.

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